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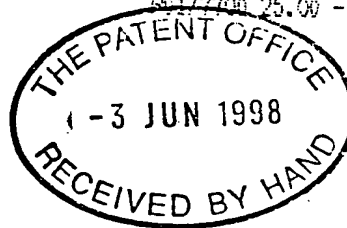
Dated

13 JUL 1999

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Patents Form 1/77
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The
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Request for grant of a patent

The Patent Office
Cardiff Road
Newport
Gwent NP9 1RH

1. Your reference
5271301/HJF/NF

2. Patent Application Number
03 JUN 1998

9811941.5

3. Full name, address and postcode of the or of each applicant (*underline all surnames*)

Robert Kaplan
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7235146001

Patents ADP number (*if known*)

If the applicant is a corporate body, give the
country/state of its incorporation

Country: *****
State: *****

4. Title of the invention
METHOD AND APPARATUS FOR ADDRESSING A COMPUTER NETWORK

5. Name of agent
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Patents ADP number

1826001

6. Priority details

Country

Priority application number

Date of filing

Patents Form 1/77

7. If this application is divided or otherwise derived from an earlier UK application give details

Number of earlier of application

Date of filing

8. Is a statement of inventorship and or right to grant of a patent required in support of this request?

NO

9. Enter the number of sheets for any of the following items you are filing with this form.

Continuation sheets of this form

Description 15

Claim(s) 12

Abstract 1

Drawing(s) 7 + 1

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and
right to grant of a patent (*Patents form 7/77*)

Request for preliminary examination
and search (*Patents Form 9/77*) 1

Request for Substantive Examination
(*Patents Form 10/77*)

11. I/We request the grant of a patent on the basis of this application

Signature Beresford & Co
BERESFORD & Co

Date 3 June 1998

12. Name and daytime telephone number of
person to contact in the United Kingdom

H.J. FIELD

Tel: 0171-831-2290

METHOD AND APPARATUS FOR ADDRESSING A COMPUTER NETWORK

The present invention relates to a method and apparatus for creating a communication link between two computers in a network. In particular, the present invention concerns a method and apparatus for creating a communication link between a local computer and a remote server station.

With the growth of the Internet in recent years, it has become increasingly difficult to find specific web pages on the Internet. Although to a certain extent browser programs automate the process of searching for a web page, the success of a browser program is dependent upon the key words used for a search. If the key words are insufficiently specific too many candidate web pages will be returned and the number of pages to be considered will not be reduced to manageable proportions. If the search criteria are overly specific, pages of interest may not be found.

It is of course possible for a web address to be recorded in a printed document. For example an advert for a company will often include reference to that company's web page. However, this can be unsatisfactory from the company's viewpoint as a user is required to type in the web address manually in order to view the web page. The necessity of manual input decreases the chance that anyone viewing the advert will actually visit the web page and also gives rise to the possibility that the

address may be incorrectly entered.

A further problem arising with the growth of the Internet is that at times of peak use communication can become very slow. The use of dedicated telephone numbers to provide connections to servers has provided a solution to the congestion on the Internet. However, this has been achieved only by requiring a user to enter a specific telephone number in order to connect directly with that server rather than using the Internet connection generated by a local server. The input of a dedicated telephone number in order to make a connection provides a further opportunity for error.

The present invention has been made in view of the above problems and seeks to provide an alternative method and apparatus for enabling a user to connect to a remote server.

The present invention also aims to provide a method and apparatus for enabling a user to connect to a remote server with fewer opportunities for human error than in the prior art.

In accordance with one aspect of the present invention, there is provided a computer network addressing system for generating a communications link between two computers, the system comprising reading means for reading address data from a document; interpretation means for interpreting address data read by said reading means; and linking means for forming a

communication link between said computers, said linking means forming said communication link based upon said address data as interpreted by said interpretation means.

5 An embodiment of the present invention includes reading means which is arranged to read address data comprising data either indicative of a direct communications link with a computer or an interconnection to a computer. The interpretation means determines which type of address data has been read by the reading means
10 and then generates a command to form a communication link between the two computers. If the address data relates to a direct communications connection, the linking means links the two computers by that direct communication link. If the reading means reads address data which
15 relates to an internet address, the linking means links to a local computer connected to the second computer via the internet and instructs the local computer to form a link to the second computer via the internet.

In accordance with a second aspect of the present
20 invention there is provided a method for creating a communications link between a computer and a remote server in which a communications link is formed on the basis of the interpretation of data read from an external recording medium.

25 An embodiment of the present invention provides a method and apparatus for addressing web pages which is sufficiently flexible to enable a user to take advantage

of any dedicated telephone connections where these are available.

Embodiments of the present invention may also be used to send data such as E-mail between a computer and
5 a remote server.

Embodiments of the present invention will now be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a schematic diagram of a computer
10 network to which the present invention may be applied,

Figure 2 is a schematic diagram of an addressing system in accordance with a first embodiment of the present invention,

Figure 3 is a schematic diagram of the reading
15 device shown in Figure 2,

Figures 4A and 4B are a flow diagram for explaining the use of the reading device shown in Figure 3,

Figure 5 is a flow diagram of a computer program stored in the computer shown in Figure 1, and

20 Figure 6 is a schematic diagram showing a second embodiment of the present invention.

Figure 1 is a schematic diagram of a computer network to which the present invention may be applied. The computer network comprises a computer 1 which is
25 connected to a communications network 2 via a modem 3. The communications network 2 may comprise a telephone network or a network of ISDN lines or the like. The

communications network 2 connects the modem 3 to a local server 100 and some remote servers 200,210. The local server 100 and the remote servers 200,210 are also connected to each other and to other remote servers 220,230, for which no direct communication link exists, via the Internet 300.

When a user of the computer 1 wishes to download information from one of the remote servers 200-230, if a direct communications link exists to that remote server the user can connect to the remote server via the modem 3 and the communications network 2 directly. This is achieved by a user causing the modem 3 to dial a number corresponding to the direct communications link to the remote server 200,210 on the communications network 2. Alternatively, the user can connect the computer 1 to the local server 100 via the modem 3 and the communications network 2 and then be indirectly connected to any of the remote servers 200-230 via the Internet 300. This is achieved by a user instructing the modem 3 to dial a number corresponding to the communications link to the local server 100 on the communications network 2 and then making use of the Internet 300 to transfer information between the local server 100 and the remote servers 200-230.

In this way if a direct communications link to a remote server exists and a user is aware of that direct communications link, the user can obtain information from

that remote server without needing to use the Internet 300. However, if no direct communications link exists or a user is not aware of a direct communications link to a remote server the user can still obtain information from the remote servers 200-230 indirectly via a local server 100 and the internet 300.

Figure 2 shows an addressing system in accordance with a first embodiment of the present invention. The addressing system comprises a computer 1 which is connected to a communications network 2 via a modem 3. The computer 1 is also connected to a reading device 4.

The reading device 4 comprises a housing 5 and a base 6. The housing 5 is connected to the base 6 in a manner so that the housing 5 and the base 6 define a slot 7 into which a document 8 may be inserted.

If a document 8 carrying a magnetic tape 9 having address data representative of a way of forming a communications link with one of the remote servers 200-230 recorded thereon is inserted into the slot 7 of the reading device 4, the reading device 4 is arranged to convey the document 8 along the slot 7 in the direction indicated by the arrow A. As a document 8 carrying the magnetic tape 9 is conveyed along the slot 7 the address data recorded on the magnetic tape 9 is read from the magnetic tape and stored in a memory buffer (not shown) in the reading device 4.

When the address data has been read from the

magnetic tape 9, the reading device 4 then transfers the address data to the computer 1 which then uses the data in accordance with a device driver program to cause the modem 3 to create a connection between the computer 1 and the remote server identified by the address data as is described in greater detail below. The device driver program may be recorded on a disc 500 and loaded into the memory of the computer 1 via a disc drive 501. Alternatively, the device driver program may be prestored in the memory of the computer 1.

Figure 3 is a schematic diagram of the reading device 4 shown in Figure 2. In Figure 3 a portion of the housing 5 has been removed to reveal the internal elements of the reading device 4. These comprise a first pair of rollers 10,11, a second pair of rollers 12,13, a read head 14 and a first and a second paper detector 15,16.

Each of the pairs of rollers 10 and 11, 12 and 13 comprises a driven roller 10,12 and a free roller 11,13. The free and driven rollers of the pairs of rollers are arranged so that they lie either side of the slot 7 defined by the base 6 and the housing 5 with the free rollers 11,13 being within and slightly protruding above the surface of the base 6 into the slot 7 and the driven rollers 10,12 being within the housing 5.

The driven rollers 10,12 are connected to a motor (not shown) which is arranged to move the rollers 10,12

between a first position within the housing 5 to a second position (shown by the dotted lines in the Figure) where the rollers 10,12 protrude in to the slot 7 and come into contact with their respective free rollers 11,13.

5 The motor is also arranged to be able to rotate the rollers 10,12 when they are in the second position.

In this way, when the drive rollers 10,12 are moved to the second position the rollers 10-13 are able to grip a document 8 which passes through the slot 7. When the

10 drive rollers 10,12 are then rotated this causes the document 8 to be conveyed along the slot 7 in the direction indicated by the arrow A.

The read head 14 is arranged in a position within the housing 5 between the pair of drive rollers 10,12.

15 The first paper detector 15 and the second paper detector 16 are arranged in the base 6 of the reading device 4 adjacent to the first free roller 11 and the second free roller 13 respectively. The paper detectors 15,16 and the free rollers 11,13 are arranged so that a document

20 which passes along the slot 7 in the direction indicated by the arrow A first passes over the first paper detector 15 then the first free roller 11 and then passes over the second paper detector 16 before passing over the second free roller 13.

25 Figures 4A and 4B are a flow diagram of a control program stored in a memory (not shown) in the reading device 4. The control program controls the action of a

motor moving the rollers 10,12 and also determines how signals received by the read head 4 are processed and controls the transfer of data stored in a memory buffer (not shown) to the computer 1.

5 Initially (S1) the reading device 4 waits until the first paper detector 15 detects that a document 8 has been inserted into the slot 7. When the first paper detector 15 detects that a document 8 has been inserted into the slot 7 the control program causes the motor to
10 lower (S2) the first drive roller 10 from its initial position within the housing 5 of the reading device 4 to its second position where in the absence of a document 8 in the slot 7 it would be in contact with the first free roller 11. The movement of the first drive roller
15 from its initial position to the second position enables a document 8 which is present in the slot 7 to be gripped between the first drive roller 10 and the first free roller 11.

When the first drive roller 10 has been moved to its
20 second position, the control program then causes a motor (not shown) to rotate the roller 10 (S3) which causes the document 8 to be conveyed along the slot 7 in the direction indicated by arrow A.

The control program then causes the second drive
25 roller 12 to be lowered (S4) from its initial position within the housing 5 to its second position where in the absence of a document in slot 7 it would be in contact

with the second free roller 13. The control program is arranged to ensure that the timing of the lowering of the second drive roller 12 is such that the front edge of a document which has passed between the first drive roller 10 and the first free roller 11 arrives between the second drive roller 12 and the free roller 13 prior to the second drive roller 12 arriving at its second position. In this way a document in the slot 7 is gripped by both the first pair of rollers 10,11 and the second pair of rollers 12,13.

When the second drive roller 12 arrives at its second position the control program causes the motor (not shown) to rotate (S5) the second drive roller 12. The rotation of the first drive roller 10 and the second drive roller 12 then co-operate to convey a document 8 present in the slot 7 along the slot 7 in the direction indicated by the arrow A.

After the control program has initiated the movement of the second drive roller 12 into its second position, the program waits (S6), until the second paper detector 16 detects the presence of a document in the slot above the second paper detector 16. When a document is detected by the second paper detector 16 the control program engages the read head 14 to read data (S7) from a magnetic strip 9 on the document 8. The data read from the magnetic strip 9 is stored in a memory buffer (not shown). The data on the magnetic strip 9 can comprise

a web address for one of the remote servers 200-230 and a designation of a specific web page or a designation of a specific web page and a direct network connection number for connecting with a remote server 200,210 where
5 such a direct communications link exists. Alternatively, the data on the magnetic strip 9 could comprise only a web address or a direct network connection number without any designation of a specific web page.

The data on the magnetic strip 9 is read until the
10 second paper detector 16 detects that there is no longer a document in the slot above the second paper detector 16 (S8). When the end of the document has been detected the control program causes the motor to stop rotating the drive rollers 10,12 and withdraw the drive rollers 10,12
15 to their initial position (S9). The control program then sends an interrupt signal (S10) to the computer 1 to indicate that the reading device 4 has read data from a magnetic tape 9 and has that data stored in its memory buffer.

20 The read device then waits (S11) for a request to be received from the computer 1 requesting that the data stored in the memory buffer should be transmitted to the computer 1. When a request is received from the computer 1, the reading device 4 transmits (S12) the data stored
25 in the memory buffer to the computer 1.

Figure 5 is a flow diagram of an interrupt driven device driver control program stored in the computer 1.

When an interrupt signal (S20) is received from the reading device 4, the computer 1 causes a request (S21) to be sent to the reading device 4 requesting that the reading device 4 sends the computer 1 the data that it has stored in its memory buffer. The computer 1 then (S22) downloads data from the reading device 4 and stores that data in memory (not shown). The device driver control program then causes the computer 1 to analyse (S23) the data which is now stored in memory. If it is detected that the data stored in memory relates to a web address, the device driver control program then causes the modem 3 to form a connection via the communication network 2 to a local server 100 (S24). The local server 100 is then instructed to connect to one of the remote servers 200-230 via the Internet 300, using the web address stored in memory.

If the device driver control program detects that the data stored in memory relates to a direct network connection to a remote server 200,210, the computer 1 sends an instruction to the modem 3 to make a connection direct to the remote server 200,210 indicated by the data via the communication network 2 (S25).

When a connection to one of the remote servers 200-230 has been made via the modem 3 and the communication network 2 either directly or indirectly, if a designation of a specific web page has been received from the reader, a request to download that specific web page is made. If

no designation of a specific web page has been received from the reader, a default web page designation stored in the memory of the computer is used to make a request to download a web page. The computer then downloads (S26) a web page from the remote server.

Figure 6 shows an addressing system in accordance with a second embodiment of the present invention. In this embodiment the reading device 50 is arranged to read barcode information 51 printed on a document 8. The other elements shown in Figure 5 correspond to those shown in Figure 1 and are indicated by the same reference numbers.

In this embodiment the reader 50 is arranged to be manually moved across a document 8 having a barcode 51 printed thereon. The reader 50 converts the data received from the barcode into data indicating a web page and a direct connection to one of the remote servers 200-230 or a web page and a web address, or just a web address or direct communication link. As previously described, this data is stored in a memory buffer (not shown). When the reader 50 detects that data for an entire barcode has been read and stored in the memory buffer the reader 50 sends an interrupt request to the computer 1 which is dealt with in a similar manner to that previously described in relation to the first embodiment.

Although the previous embodiments have been

described in which reference has been made to connections via the Internet, it will be appreciated that the present embodiment is equally applicable to a local area network such as that used within an office. It will also be appreciated that although reference has previously been made to the downloading of web pages the present application is equally applicable to the transfer of any type of data such as E-mail, data being sent to news groups or data files being transferred.

Although reference has previously been made to reading and storing address data, it will be appreciated that other data could be recorded on a magnetic tape or in a barcode and that this data could be sent to a remote host when a connection to the remote host is made.

Although reference has previously been made to an addressing system in which a computer automatically generates a communications link to a remote server upon receipt of address data from a reader, it will be appreciated that address data could be stored in the computer to generate a communications link to a remote server later. It will further be appreciated that address data for a plurality of remote server stations could be stored and a communications link could be generated on the basis of selection of stored address data.

Although previous embodiments have been described in which reference is made to a magnetic tape being

present on a document, it will be appreciated that this magnetic tape could be a magnetic strip printed onto a document. It will also be appreciated that although reference has been made to recording information on a magnetic tape, and information being recorded as a barcode, any recording format which enables address data to be recorded could be used, such as optical or magneto-optical recording methods.

CLAIMS:

1. A computer network addressing system for generating
a communications link between a computer and a remote
5 server comprising:

reading means for reading address data from an
external medium;

interpretation means for interpreting address data
read by said reading means; and

10 communications link command generation means for
generating a command for forming a communications link
between a computer and a remote server based upon the
interpretation of address data by said interpretation
means.

15

2. A computer network addressing system in accordance
with claim 1, wherein said reading means is arranged to
read address data comprising: network address data
indicative of an address of a remote server in a network
20 including said remote server and a local server; and

said communications link command generation means
is arranged to generate a command to form a
communications link between a computer and a local server
via a communications network and to transfer a request
25 to said local server to form a communications link to
said remote server.

3. A computer network addressing system in accordance with claim 1 or 2, wherein said reading means is arranged to read address data comprising: network address data indicative of a direct communications link to a remote
5 server via a communications network; and

said communications link command generation means is arranged to generate a command to form a communications link between said computer and said remote server via said communications network.

10

4. A computer network addressing system in accordance with claim 3 when dependent upon claim 2, wherein said interpretation means is arranged to interpret address data read by said reading means to determine whether said
15 data is indicative of an address of a remote server in a network or indicative of a direct communications link to a remote server, wherein said communications link command generation means is arranged to generate a command to form a communications link between a computer
20 and a local server via a communication network or a computer and said remote server via a direct communications link based upon an interpretation of said address data by said interpretation means.

25 5. A computer network addressing system in accordance with any preceding claim, further comprising storage means for storing address data read by said reading means

and selection means for selecting address data stored in said storage means, wherein said communications link command generation means is arranged to generate a command for forming a communications link between a computer and a remote server based upon the selection of address data by said selection means.

6. A computer network addressing system in accordance with any preceding claim, wherein said reading means is arranged to read data in addition to address data from a document, wherein said communications link command generation means is further arranged to transfer said additional data read by said reading means to a remote server via a communications link formed on the basis of a command generated by said communications link command generation means.

7. A computer network addressing system in accordance with any preceding claim, wherein said communications link command generation means is arranged to generate a command for retrieving data from a remote server via a said communications link formed between a computer and a remote server.

8. A computer network addressing system in accordance with claim 7, wherein said reading means is arranged to read request data wherein said communications link

command generation means is arranged to generate a command for requesting the transfer of data from a remote server based upon request data read by said reading means.

5

9. A computer network addressing system in accordance with claim 8, wherein said address data comprises a web address and said request data identifies a specific web page to be retrieved from said remote server.

10

10. A computer network addressing system in accordance with any preceding claim, wherein said reading means comprises a barcode reader.

15

11. A computer network addressing system in accordance with any of claims 1 to 9, wherein said reading means comprises means for reading any of magnetic, optical or magneto-optical information present on a document.

20

12. A computer network addressing system in accordance with any preceding claim comprising:

a reading device comprising said reading means for reading address data from an external medium,

a computer connected to said reading device, said
25 computer comprising: said interpretation means for interpreting address data read by said reading means, said computer also comprising:

said communications link command generation means
for generating a command for forming a communications
link between said computer and a remote server based on
the interpretation of address data by said interpretation
5 means.

13. A computer network addressing system in accordance
with any of claims 1-11 comprising: a computer, said
computer comprising

10 said communications link command generation means
for generating a command for forming a communications
link between a computer and a remote server based upon
the interpretation of address data by said interpretation
means, and

15 a reading device, connected to said computer, said
reading device comprising:

reading means for reading address data from an
external medium, said reading device also comprising:
interpretation means for interpreting address data read
20 by said reading means.

14. A reading device for use in a computer network
addressing system in accordance with claims 12 or 13,
comprising: a housing, a read head arranged to read
25 address data from a document, and a base attached to said
housing, wherein said base and said housing are arranged
to define a slot into which a document can be placed,

wherein said read head is carried by said housing and arranged to read address data from documents placed in said slot.

- 5 15. Apparatus in accordance with claim 14, further comprising conveyance means for conveying a document present in the slot defined by said housing and said base past said read head in order to enable said read head to read address data from a document present in the slot.

10

16. A device driver program recorded on a recording medium, said device driver program being arranged to generate, within a computer, communications link command generation means for generating a command for forming a
15 communications link between a computer and a remote server based on the interpretation of address data by an interpretation means.

17. A device driver program recorded on a recording
20 medium in accordance with claim 16, wherein said device driver program is further arranged to generate, within a computer, interpretation means for interpreting address data read by a reading means.

- 25 18. A method of generating a communications link between a computer and a remote server in a computer network, comprising the steps of:

reading address data from an external medium;
interpreting address data read from said external
medium; and

generating a command for forming a communications
5 link between a computer and a remote server based upon
the interpretation of address data read from said
external medium.

19. A method of generating a communications link between
10 a computer and a remote server in accordance with claim
18, wherein said reading step comprises reading network
address data indicative of an address of a remote server
in a network including said remote server and a local
server and said generation step comprises generating a
15 command to form a communications link between a computer
and a local server via a communications network, and
transferring a request to said local server to form a
communications link to said remote server.

20 20. A method of generating a communications link between
a computer and a remote server in accordance with claim
18, wherein said reading step comprises reading network
address data indicative of a direct communications link
to a remote server via a communications network and said
25 generation step comprises generating a command to form
a communications link between said computer and said
remote server via said communications network.

21. A method of generating a communications link between a computer and a remote server in accordance with claim 18 wherein said interpretation step comprises interpreting whether address data read from an external medium is indicative of an address of a remote server in a network or indicative of a direct communications link to a remote server, wherein if said interpretation step determines that data is indicative of an address of a remote server in a network, said generation step comprises generating a command to form a communications link between a computer and a local server via a communications network and transferring a request to said local server to form a communications link to said remote server, and if said interpretation step determines that data is indicative of a direct communications link to a remote server, said generation step comprises generating a command for forming a communications link between the computer and a remote server via said direct communications link.

20

23. A method in accordance with any of claims 18-22, further comprising the steps of storing address data read from an external medium and selecting address data stored; wherein said generation step comprises generating a command for forming a communications link between a computer and a remote server based upon the selection of address data.

25

24. A method of generating a communications link between a computer and a remote server in accordance with any of claims 18-23, further comprising the steps of:

reading further data in addition to said address
5 data from an external medium, and transferring said further data read from said external medium to a remote server via a communications link formed on the basis of a command generated in said generation step.

10 25. A method for generating a communications link between a computer and a remote server in accordance with any of claims 18-24, further comprising the step of retrieving data from a remote server via said communications link formed on the basis of said
15 generations step.

26. A method of generating a communications link between a computer and remote server in accordance with claim 25, further comprising the step of reading request data from
20 an external medium and requesting the transfer of data from a remote server based upon request data read from said external medium.

27. A method for generating a communications link in
25 accordance with claim 26, when said request data identifies a specific web page to be retrieved from said remote server.

28. A computer having a program stored therein, said computer thereby being arranged to: process address data read from an external medium; interpret said received address data; and generate a command for forming a communications link between a computer and a remote server based upon the interpretation of said address data.

29. A computer having a program stored therein in accordance with claim 28, wherein said computer is further arranged to generate a command to form a communications link between a computer and a local server via a communications network and to transfer a request to said local server to form a communications link to said remote server.

30. A computer having a program stored therein in accordance with claim 28 or 29, wherein said computer is further arranged to generate a command to form a communications link between the computer and a remote server via a communications network.

31. A computer having a program stored therein in accordance with claim 30 when dependent upon claim 29, wherein said computer is further arranged to interpret address data received to determine whether the data is indicative of an address of a remote server in a network

or indicative of a direct communications link to a remote server, said computer being arranged to generate a command to form a communications link between a computer and local server via a communications network or a
5 computer and said remote server via a direct communications link based upon said interpretation of said address data.

32. A computer having a program stored therein in
10 accordance with any of claims 28-31, wherein said computer is further arranged to transfer a portion of said data read from an external medium, to said remote server via said communications link formed on the basis of said generated command.

15

33. A computer having a program stored therein in accordance with any of claims 28-32, wherein said computer is arranged to retrieve data from a remote server via said communications link formed between a
20 computer and a remote server.

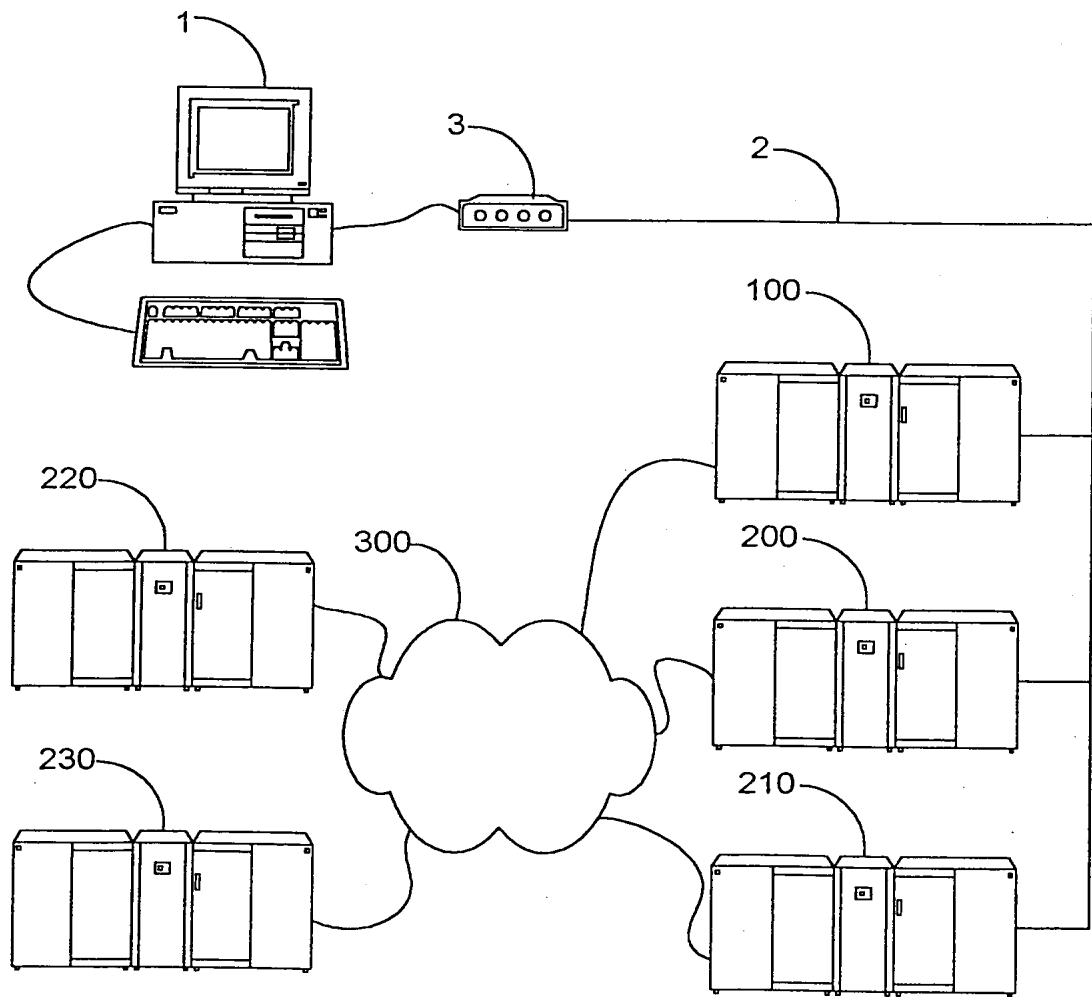
34. A recording medium having recorded thereon address data for use in a computer network addressing system in accordance with any of claims 1-13 or in a method for
25 generating a communications link between a computer and a remote server in accordance with any of claims 18 to 27.

35. A computer network addressing system for generating a communications link in between a computer and a remote server as described with reference to the Figures.

METHOD AND APPARATUS FOR ADDRESSING A COMPUTER NETWORKABSTRACT

5 A document (8) having address data (9) in a machine
readable form is passed through a reading device (4).
The address data is then stored in a memory in the
reading device (4) and then transferred to a computer
(1). The computer then interprets the data read by the
10 reading device (4) and generates a command to form a
communications link to a remote server either directly
via a communications network (2) or indirectly via a
local server (100) and the Internet (300).

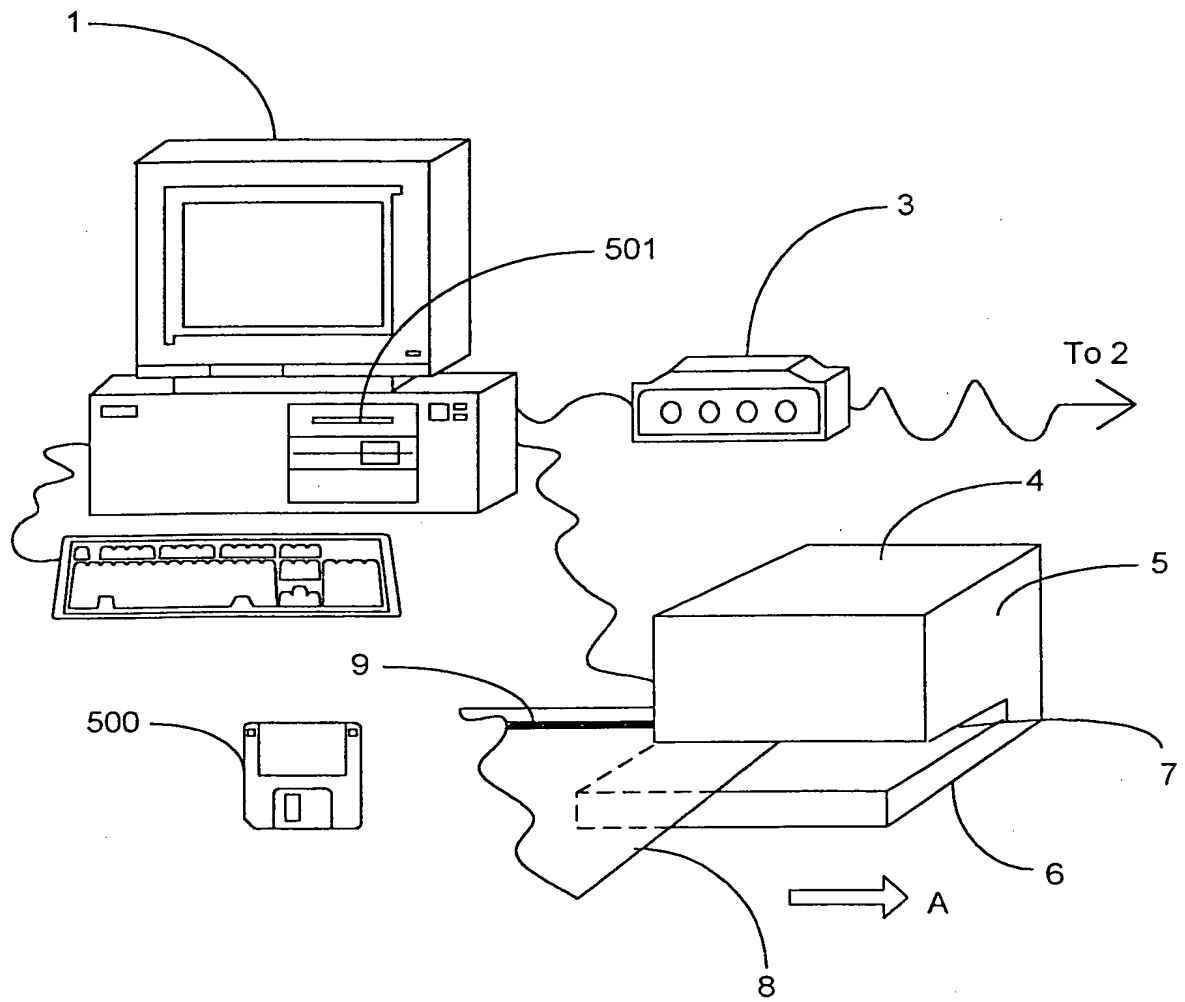
FIG. 1



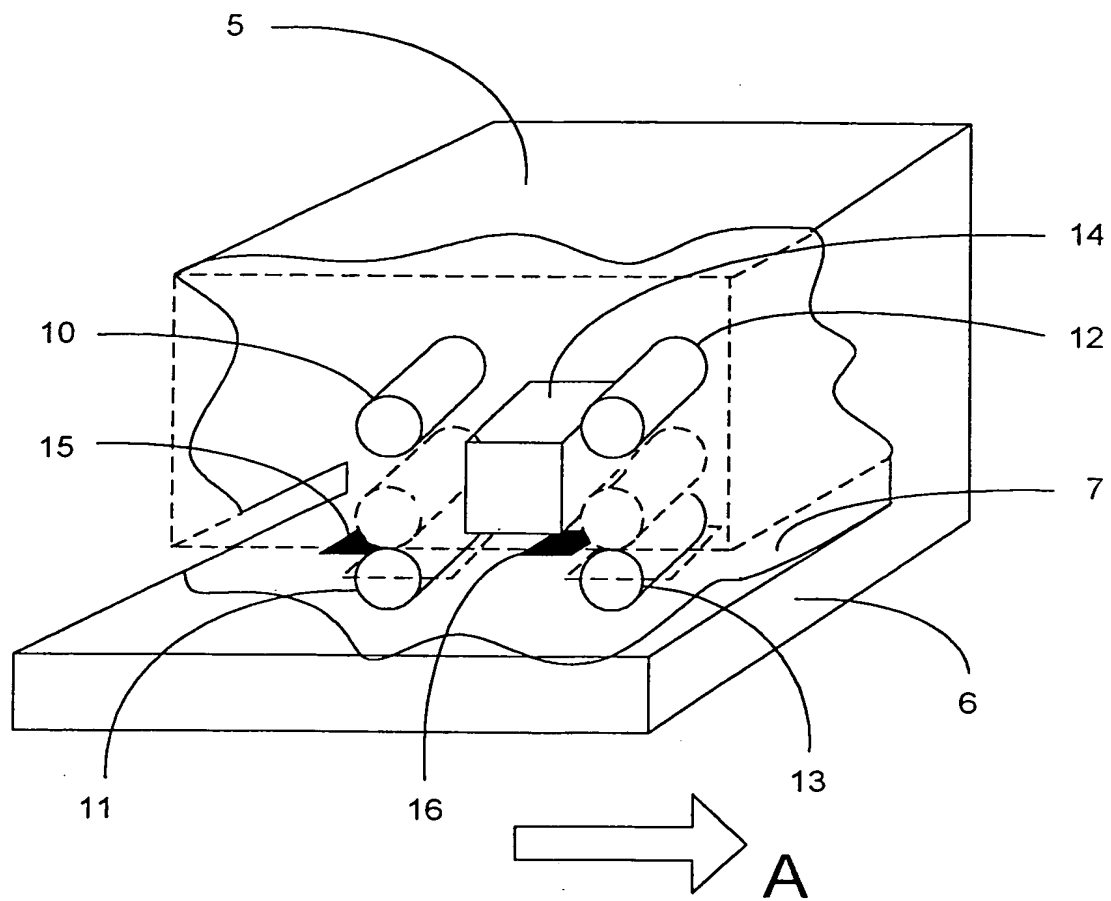
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FIG.2

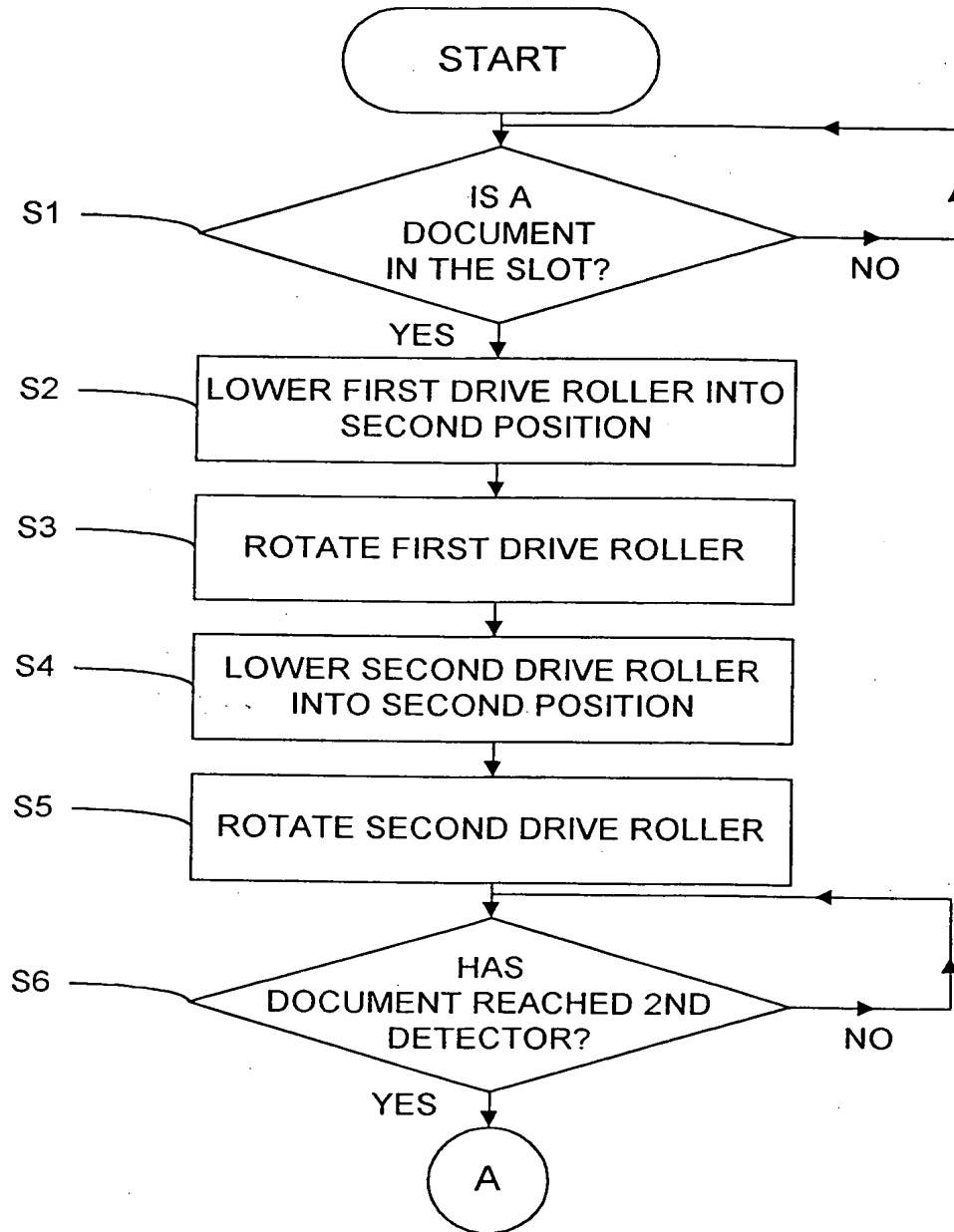


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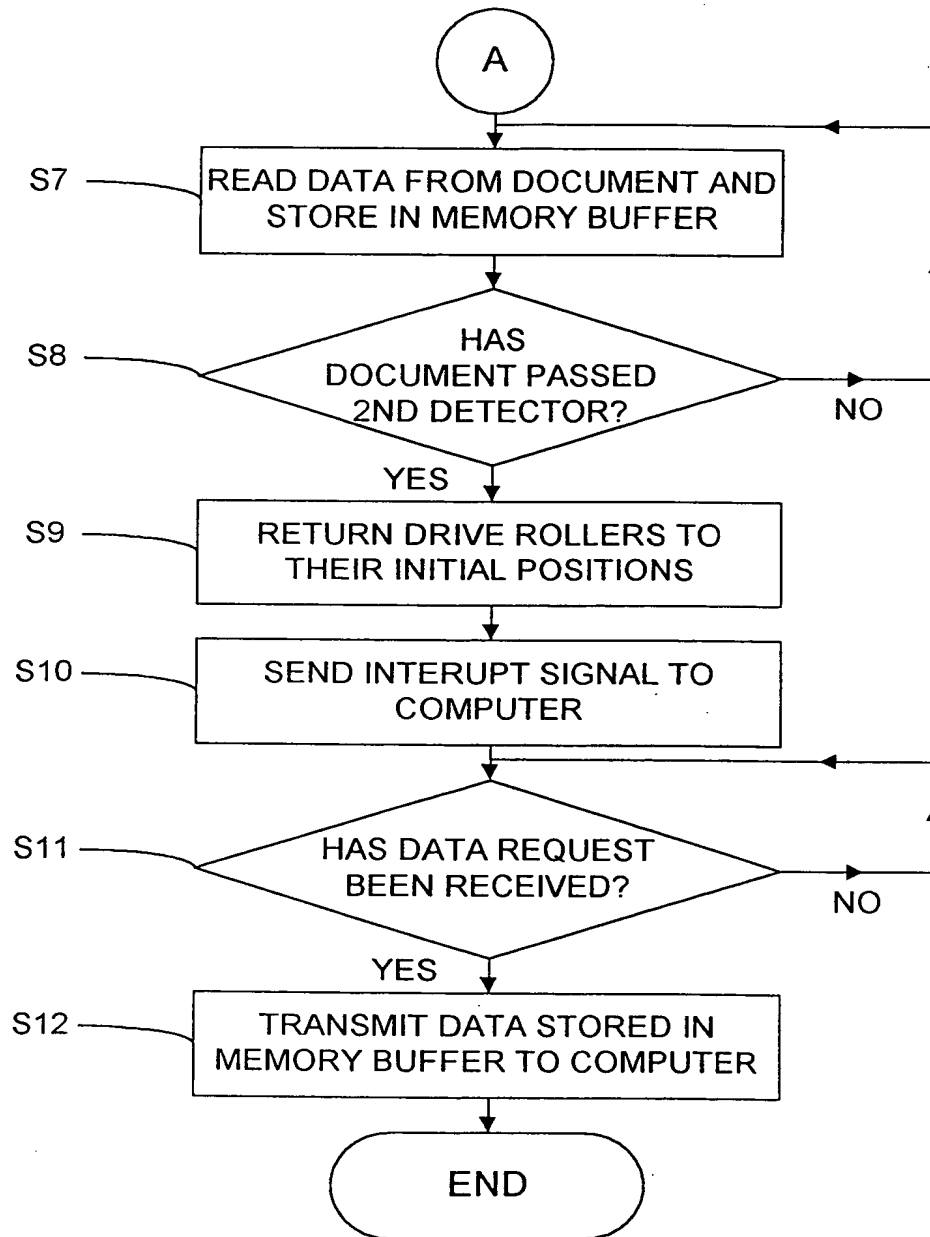
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FIG.4A



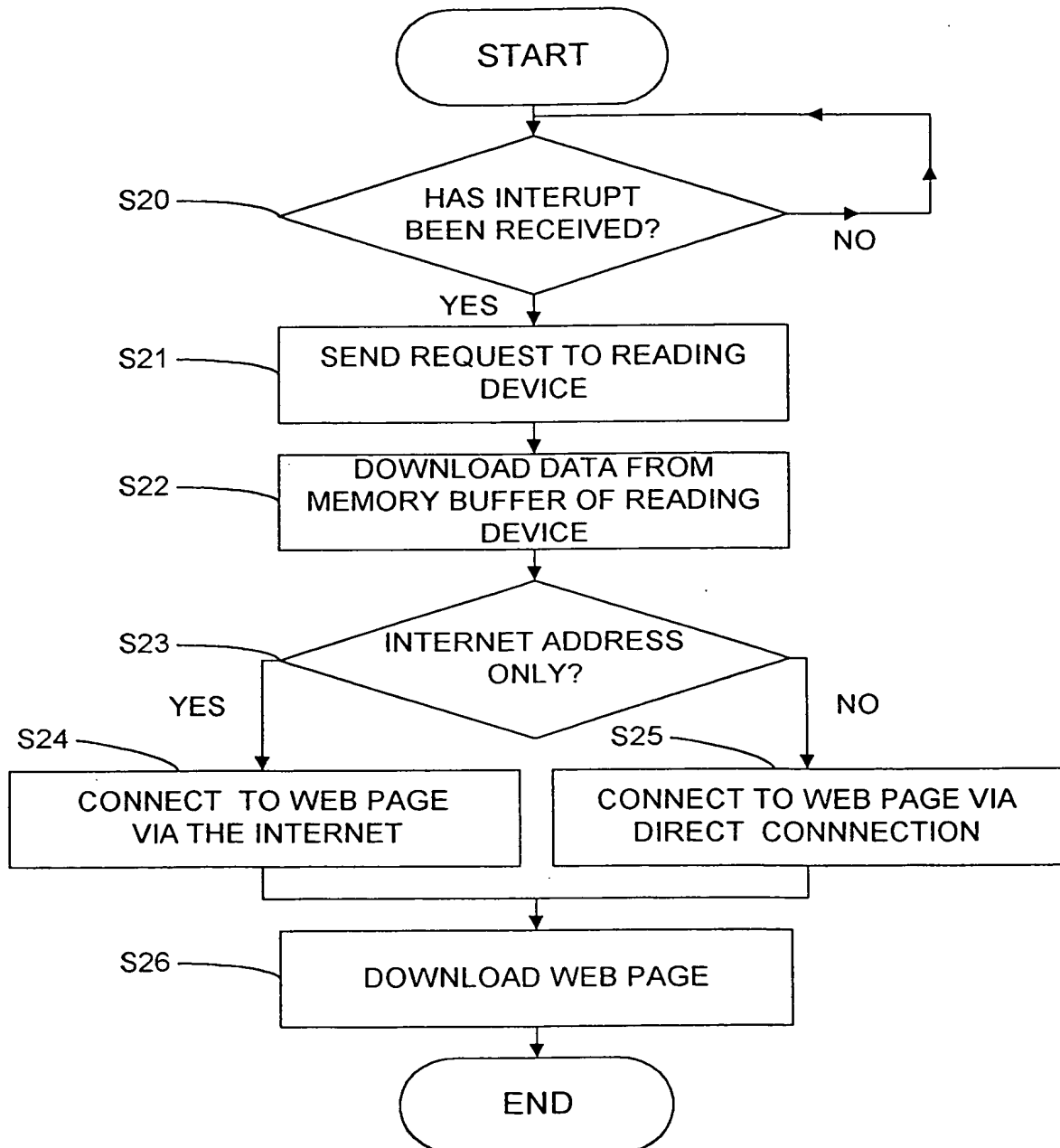
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FIG.4B



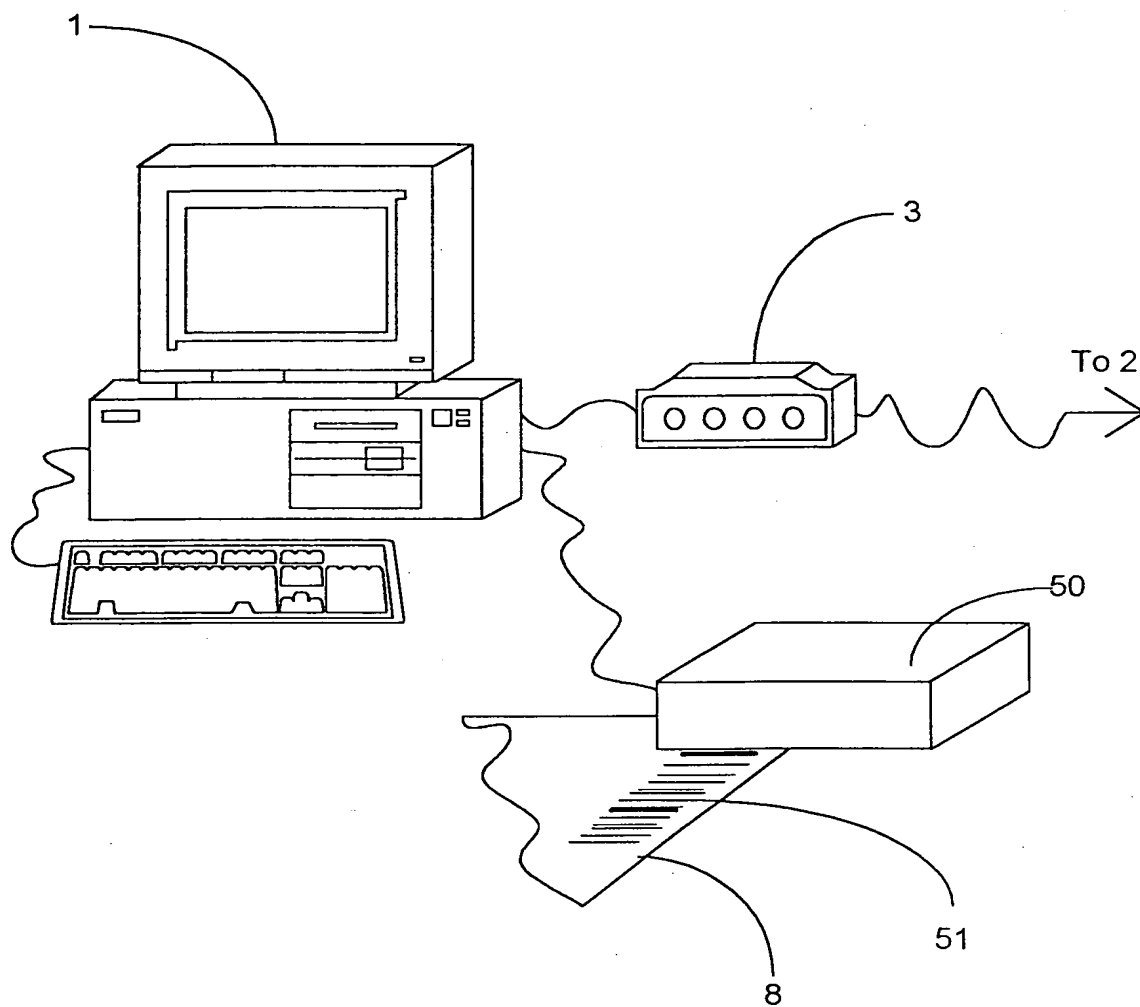
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FIG.5



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FIG.6



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